

ORIENTATION TO COMPUTING - I

L T P: 2 0 0

COURSE WEIGHTAGE & TEXTBOOKS



L-T-P: 2-0-0

[Two Lectures per week] – Credits: 02

[No Lab hours per week]

Course Assessment Model:

➤ Attendance	: 20 M
➤ CA	: 50 M
➤ ETT	: 30 M
<hr/>	
Total	: 100 M

Reference Text Books (T):

1. **RED HAT RHSCA/RHCE 7 by SANDER VAN VUGT, PEARSON**
2. **OPERATING SYSTEM CONCEPTS by ABRAHAM SILBERSCHATZ, PETER B. GALVIN, GERGE GAGNE, WILEY**

VISION & MISSION – SCHOOL



VISION:

To be a globally recognized school through excellence in teaching, learning, and research for creating Computer Science professionals, leaders, and entrepreneurs of the future contributing to society and industry for sustainable growth.

MISSION:

M1: To build computational skills through hands-on and practice-based learning with measurable outcomes.

M2: To establish a strong connect with industry for in-demand technology driven curriculum.

M3: To build the infrastructure for meaningful research around societal problems.

M4: To nurture future leaders through research-infused education and lifelong learning.

M5: To create smart and ethical professionals and entrepreneurs who are recognized globally.

COURSE OUTCOMES



Course Outcome	Description
CO 1	understand the various functional components of a computer system and basics of computer language.
CO 2	explain operating system components and functionalities, and manage various file systems and processes in Windows and Linux.
CO 3	describe Linux OS features, installation, directory structure, disk partitions, shell commands, kernel types, and comparison with Windows OS.
CO 4	predict cohorts based on their technical skillset, understand the relevance of various pathways, and obtain insights of MOOC 's platforms.
CO 5	understand network components, configurations, and server types, and identify and mitigate security issues effectively.
CO 6	practice technical concepts of version control using git and GitHub and create technical profiles on different computing platforms

PROGRAM OUTCOMES



PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems

PO2: Problem Analysis: Identity, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using the first principles of mathematics, natural sciences, and engineering sciences

PO3: Design/Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis, and interpretation of data, and synthesis of the information to provide valid conclusions

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

PROGRAM OUTCOMES



PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

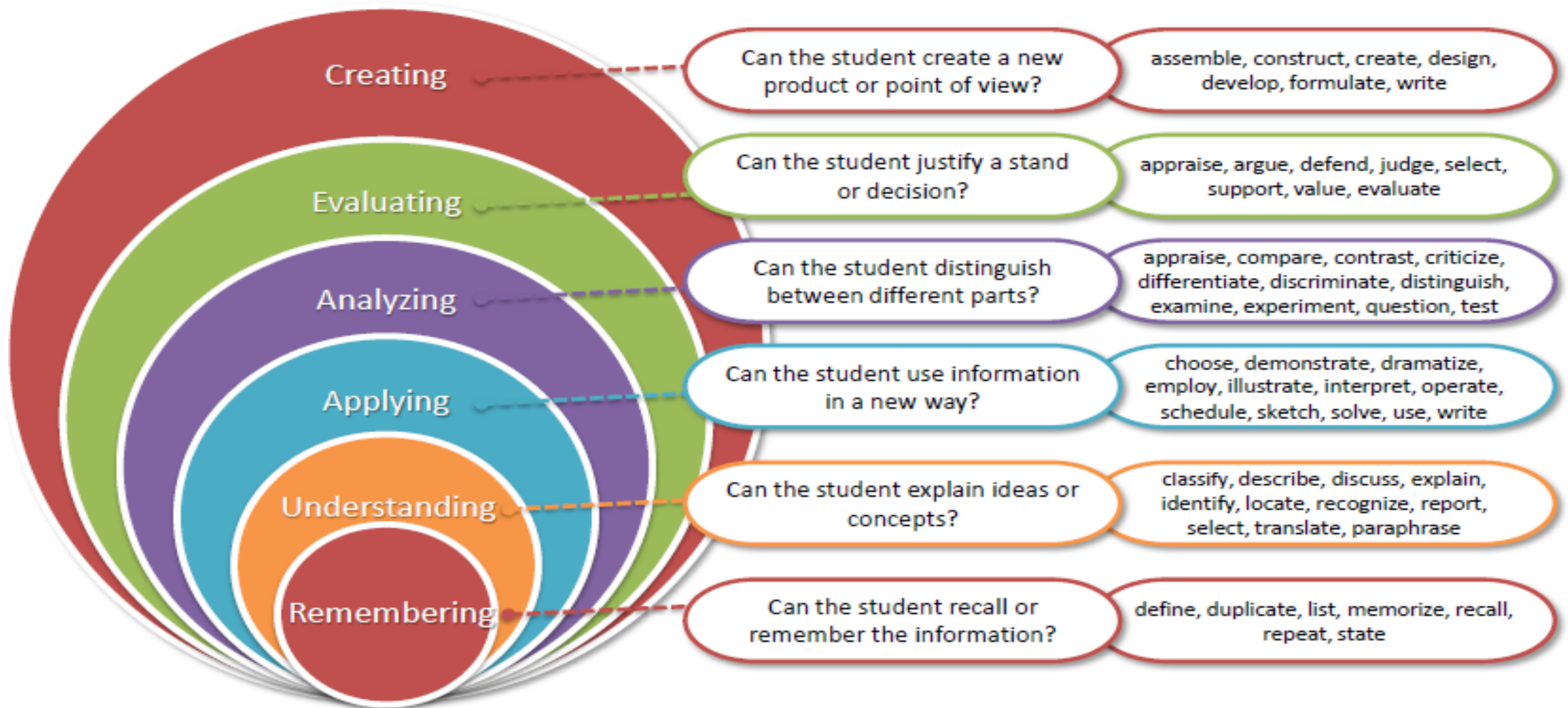
PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

BLOOM's TAXONOMY



WHAT are COHORT's?

- A group of students of a common programme who intend to attain **similar characteristics** by means of learning **similar skills** in order to target a particular career opportunity.

COHORT's PURPOSE



1. Student shall be able to have a goal-oriented approach to his/her career
2. Student identifies the goal in the very first year
3. Students shall be able to follow the stage-wise career progression.
4. Early identification of the skill set required for a selected goal.

OUTLINE of COHORT's



Cohort 1: Software Development (Product Based)



Cohort 2: Data Science



Cohort 3: Cyber Security



Cohort 4: Full Stack Web Development



Cohort 5: Machine Learning



Cohort 6: Cloud Computing



Cohort 7: Software Methodologies And Testing



Cohort 8: Software Development (Service Based)



Cohort 9: Entrepreneurship



Cohort 10: Mobile Application Development



Cohort 11: Government jobs/Higher studies

CONTENTS



❖ Unit I

Computer Systems: Basic structure of a computer and its working, Computer associated peripherals, Memories - RAM, ROM, Secondary storage devices, System Configuration – features and comparison (SSD vs hybrid, types of RAMs, Processors - cores/threads), BIOS Configuration, Compare and contrast PC connection interface (USB, SATA, HDMI, NFC, Bluetooth), RAID, GPU basics, Synchronization across CPU and GPU.

Computer Languages: Machine language, Assembly language, High-level language, Steps in the development of a program, Compilation and Execution, Compiler, Interpreter, Assembler.

❖ Unit II

Operating System: Operating Systems and its components, Windows Operating System Versions and features, Installation Process, Directory Hierarchy of Windows Operating System (Single level and multiple levels), Bootloader.

File system management: File system basics, Types of file systems (FAT, GFT, HFS, NDFS, UDF, Extended file systems), Pipes and redirection, Searching the file system using find and grep with simple regular expressions, Basic process control using signals, Pausing and Resuming process from a Linux terminal, terminating a process, Adding/removing from search path using PATH variable.

CONTENTS



❖ Unit III

Linux Operating System: Linux OS and its features, Distribution versions, installation process, and Directory Hierarchy of Linux System (single level and multiple levels)., Partitions: Understanding disk partitions and obtaining partition information using system tools, Comparison of Windows and Linux OS, and Virtual Machines.

Other Shell commands: ls, cat, man, cd, touch, cp, mv, rmdir, mkdir, rm, chmod, pwd, ps, kill, etc, Kernel and types of kernels

❖ Unit IV

Cohorts and Skill Sets: Introduction to Cohorts, Purpose of Cohorts, Companies, Skills required and skill sources for different Cohorts (Internal and External)

Types of Cohorts: Cloud Computing, Cyber Security, Data Science, Full Stack Development, Machine Learning, Software Methodologies and Testing, UI/UX, Metaverse and Internet of Things, Job Roles for Different Cohort

Pathways : Introduction to Pathways, Purpose of Pathways, Job Roles for Different Pathways, Types of Pathways: Product Based, Service Based, Government Jobs, Higher studies, Entrepreneurship

MOOCs and Hackathons : Introduction to MOOCs and Hackathons, Types of MOOCs, Various MOOCs Platforms, Benefits of MOOCs, Globally Recognized Hackathons and Competitions, MAANG Companies

CONTENTS



❖ Unit V

Computer Network and Communication: Network types (wired and wireless), Network topologies, Network communication devices (Routers, Switches, Modems, Hubs, access point), Setting IP addresses, sharing files and folders, Remote Login, SSH, Wireless Security (http vs https), Client Server model, Types of Servers (Proxy servers, Application server, Web server, File server, Database server, Synchronization server, Log server).

Security Essentials: Basic security threats (malwares, Phishing, Social engineering, Password cracking), Password management (Password complexity, Change default passwords), Open Wi-Fi vs. secure Wi-Fi, Multi Factor authentication, Admin vs. user vs. guest Account.

❖ Unit VI

Version Control: Overview of Git and GitHub, Install Git and create a GitHub account, Create a local Git repository, Add a new file to the repository, Create a commit, Creation of a new Branch

Profile Creation: Figma, GitHub, Stack overflow, HackerRank, HackerEarth, GeeksforGeeks.

WHY ORIENTATION TO COMPUTING ?



- As a computer science student in the beginner stage you need to know how the various things in a computer work and how the computer is used in multiple instances.
- You need to understand the brief descriptions of subjects that will be further explored in future subjects through your degree program.

EVALUATION CRITERIA



1. **CA1: MCQ:** It will be objective-type containing 30 MCQ questions of 1 mark each, which includes analytical and logical scenario-based questions.
2. **CA2: Non-Technical Online MOOC course:** Students will complete one short-duration Non-Technical MOOC of their choice from the approved list only and submit the completion certificate.

Link for Approved list :

https://docs.google.com/spreadsheets/d/1dsX2P_--m8cHZayyj0DhjfJ2crMco93QQVsBAQoM_wU/edit?usp=sharing

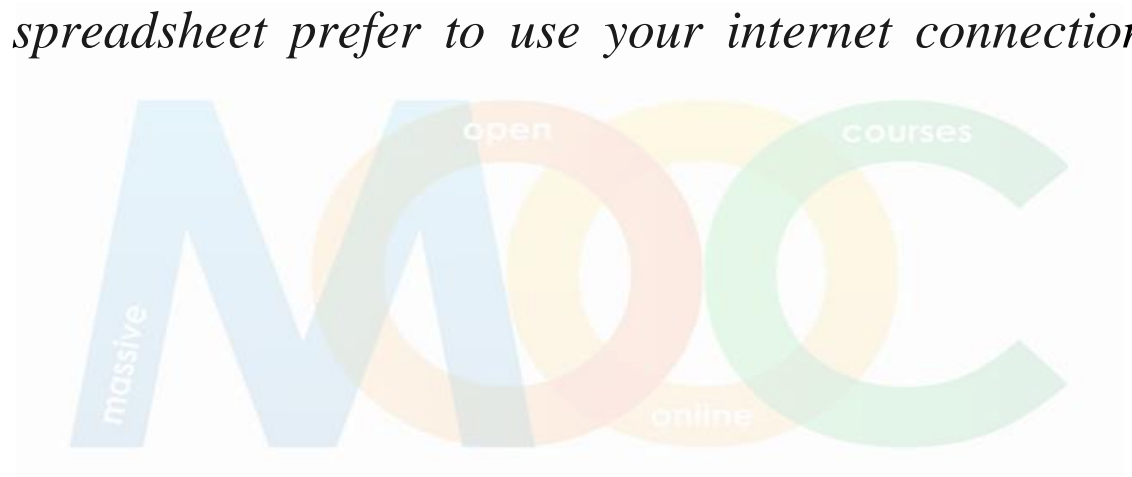
******The spreadsheet list will be updated well before in time.***

(Note – While going through the links mentioned in the spreadsheet prefer to use your internet connection (personal hotspot) in case it's not working on WIFI.)

Total 30 Marks

Certificate Submission – 15 Marks

Viva/Presentation – 15 Marks



EVALUATION CRITERIA



3. **CA3: Portfolio/CV creation:** Students will prepare a CV, register in one technical MOOC create profiles, and take insights into various platforms like GitHub, Stack Overflow, Linked In, Hacker Rank, Hacker Earth, etc.

Rubrics to be followed:

- a. CV creation [5 marks]
- b. Technical MOOC Registration Proof [5 Marks]

**** Students will select MOOCs of their choice from the approved list only which will be shared by the teacher well before time. This MOOC needs to be completed in the winter break and the completion certificate of this MOOC will be considered as CA1 of CSE121 (ORIENTATION TO COMPUTING – II) in 2nd semester along with its evaluation.*

- a. GitHub with repositories and forks [10 marks]
- b. Profile creation and activities by students on various technical platforms [10 marks]



EVALUATION CRITERIA

Out of these three CA's, **CA3 is Mandatory**, and out of the remaining two CA's 1 best will be considered.

		Weightage
CA1: Multiple Choice Questions (MCQs)	} (Best of One)	50%
CA2: Non-Technical Online MOOC course		
CA3: Portfolio/CV creation (Mandatory)		50%

Note:

1. MTE: There will be no MTE applicable for this course.
2. ETE: The ETE of this course involves MCQs-based analytical, logical, and scenario-based questions. There will be a 0.25% negative marking in the MCQ

Mapped MOOC For CA Exemption



MOOCs are the best way to learn the technologies apart from regular courses. To encourage the students for this, one MOOC is approved and one CA exemption is given upon completion. Details of this MOOC are:

Title of the MOOC	Duration	LINK	Exemption
Linux Commands and Shell Scripting	15 hours	https://skillera.org/ExploreCourses	1 CA (Except mandatory one)
Introduction to Git and GitHub	27 hours	https://www.coursera.org/learn/introduction-git-github	1 CA (Except mandatory one)

- The first MOOC is related to LINUX commands which are also part of the syllabus(3rd unit). Linux commands are fundamental, and their basics are essential for coming courses like Operating Systems and Cyber Security.*
- The second MOOC is related to Git and GitHub which is also a part of the syllabus (6th unit). Git is an open-source version control tool and Git hub is a pay-per-use online service built to run Git in the cloud.*

Benefits of this MOOC:

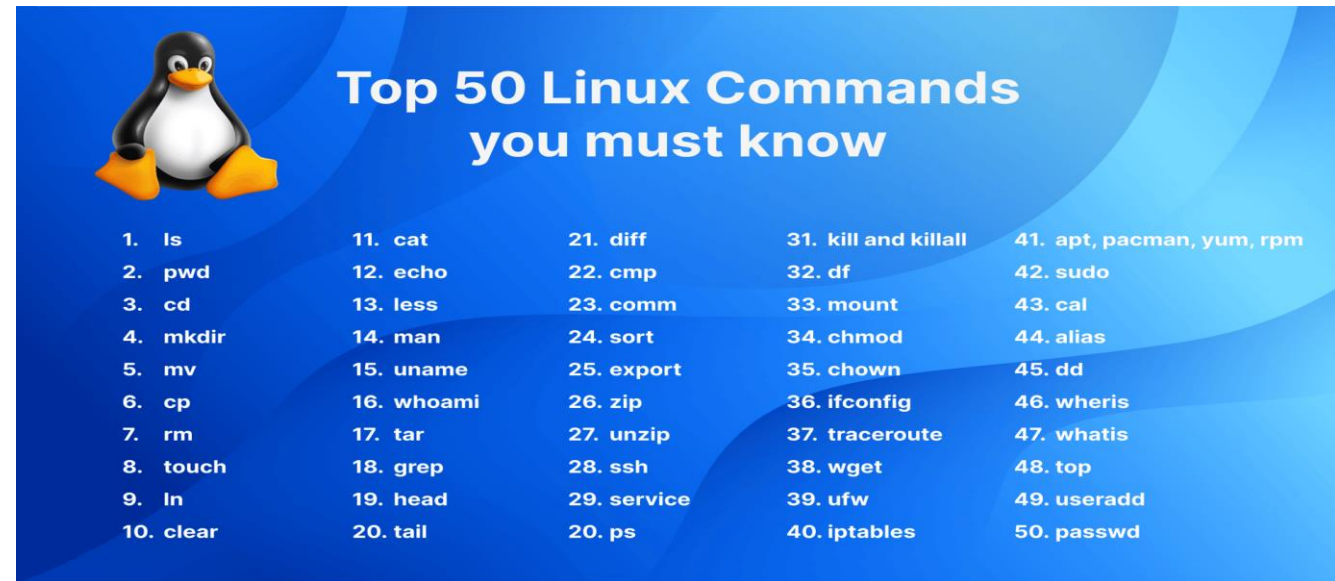
- Skill Upgradation**
- 1 CA exemption (Which will help you in improving the CA Marks in case of less marks in any CA except CA3)**

DETAILS of COURSE ENRICHMENT ACTIVITIES



As this course is a **STAR Course**. Certain activities will be conducted throughout the course duration. The details of the activities are given below:

- **Write a Blog:** Each student will write a blog on the given topic and publish it on Medium sub stack or any other social platform
- **Watch a Great Video:** Faculty will provide a pre-assigned technical video on the latest trends and technologies in computer science independently and write a 250-word report summarizing the key takeaway.
- **Tool-based Execution of Linux Commands:** Faculty will demonstrate the execution of different commands in Ubuntu or other Linux platforms/PowerShell



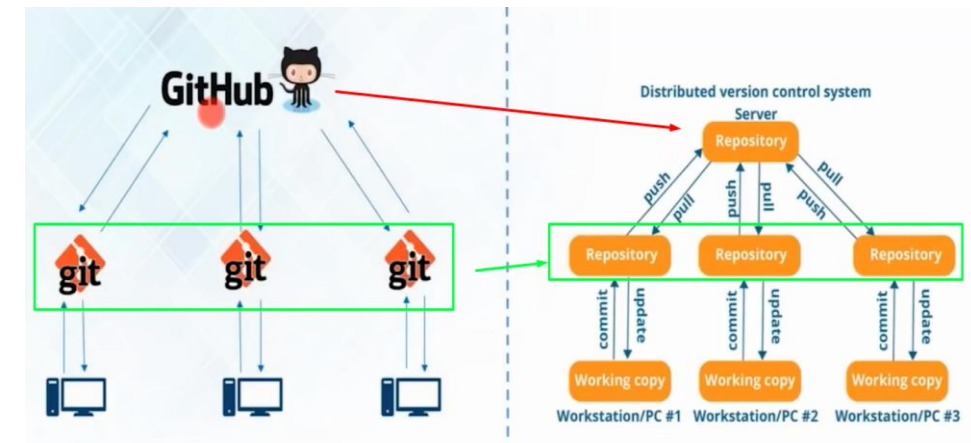
DETAILS of COURSE ENRICHMENT ACTIVITIES



- **D. Tech-I Follow:** Each student will receive a designated company name and will be tasked with researching and analyzing the company's business processes. This includes gathering information about the necessary skills, as well as exploring details regarding salary packages and more.

Note: Students will present his/her findings in a class within 3 minutes.

- **Interactive Demonstration of Network Security Threats:** The session will feature a hands-on, educational demonstration focusing on different types of network security threats.
- **Your First Commit:** Utilizing web-based software like GitHub, a live demonstration will be conducted to offer insights into the version control systems and their practical applications.



OPEN EDUCATIONAL RESOURCE



Unit mapped	Broad topic	Sub Topic	Source Type	Source Title	*%age mapping (approx.)	Source URL
Unit I	Computer Systems	Memories RAM, ROM, Secondary storage devices	Weblink	Secondary Storage Devices in Computer Organization	100%	https://www.javatpoint.com/secondary-storage-devices-in-computer-organization https://www.tmv.edu.in/pdf/Distance_education/BCA%20Books/BCA%20I%20SEM/BCA-121%20Computer%20Fundamental.pdf
Unit I	Computer Systems	Memories RAM, ROM, Secondary storage devices	Weblink	Secondary Storage: Definition & Devices	100%	https://teachcomputerscience.com/secondary-storage https://www.tmv.edu.in/pdf/Distance_education/BCA%20Books/BCA%20I%20SEM/BCA-121%20Computer%20Fundamental.pdf
Unit I	Computer Systems	System Configuration – features and comparison (SSD vs hybrid, RAM types)	Weblink	Computer System Configuration	60%	https://www.tmv.edu.in/pdf/Distance_education/BCA%20Books/BCA%20I%20SEM/BCA-121%20Computer%20Fundamental.pdf
Unit II	Operating System	Operating Systems and its components, Windows OS Versions and features	Weblink	Operating Systems Basics	70%	https://softwarekeep.com/en-in/blogs/comparisons/windows-os-history-timeline?pb=0

OPEN EDUCATIONAL RESOURCE



Unit mapped	Broad topic	Sub Topic	Source Type	Source Title	*%age mapping (approx.)	Source URL
	File System Management	Types of file systems, Basic process control using signals	Weblink	File System and Management	80%	https://www.geeksforgeeks.org/file-systems-in-operating-system/
Unit III	Linux Operating System	Linux OS features, Distribution versions, installation, Directory Hierarchy	Weblink	Linux Operating System Basics	100%	https://www.jbiet.edu.in/pdf/IT-coursematerial/Linux.pdf
Unit III	Linux Operating System	Other Shell commands, Kernel and types of kernels	Weblink	Basic Shell Commands	100%	https://www.jbiet.edu.in/pdf/IT-coursematerial/Linux.pdf
Unit IV	Cohorts and Skill Sets	Types of Cohorts, Skills required for different Cohorts	Weblink	Introduction to Cohorts and Skill Sets	80%	https://www.lpu.in/inst-performance/identification-of-cohorts-and-career-pathways.php https://www.knowledgehut.com/blog/career/career-options-after-computer-engineering#jobs-after-engineering-in-computer-science%C2%A0
Unit IV	Pathways	Purpose of Pathways, Job Roles for Different Pathways	Weblink	Career Pathways and Development	80%	https://www.gse.harvard.edu/ideas/education-now/24/02/pathways-careers-purpose

OPEN EDUCATIONAL RESOURCE



Unit mapped	Broad topic	Sub Topic	Source Type	Source Title	*%age mapping (approx.)	Source URL
Unit II	File System Management	Types of file systems, Basic process control using signals	Weblink	File System and Management	80%	https://www.geeksforgeeks.org/file-systems-in-operating-system/
Unit III	Linux Operating System	Linux OS features, Distribution versions, installation, Directory Hierarchy	Weblink	Linux Operating System Basics	100%	https://www.jbiet.edu.in/pdf/IT-coursematerial/Linux.pdf
Unit III	Linux Operating System	Other Shell commands, Kernel and types of kernels	Weblink	Basic Shell Commands	100%	https://www.jbiet.edu.in/pdf/IT-coursematerial/Linux.pdf
Unit IV	Cohorts and Skill Sets	Types of Cohorts, Skills required for different Cohorts	Weblink	Introduction to Cohorts and Skill Sets	80%	https://www.lpu.in/inst-performance/identification-of-cohorts-and-career-pathways.php https://www.knowledgehut.com/blog/career/career-options-after-computer-engineering#jobs-after-engineering-in-computer-science%C2%A0
Unit IV	Pathways	Purpose of Pathways, Job Roles for Different Pathways	Weblink	Career Pathways and Development	80%	https://www.gse.harvard.edu/ideas/education-now/24/02/pathways-careers-purpose

OPEN EDUCATIONAL RESOURCE



Unit mapped	Broad topic	Sub Topic	Source Type	Source Title	*%age mapping (approx.)	Source URL
Unit V	Computer Network and Communication	Network types, Network topologies, Network communication devices	Weblink	Computer Network Basics	80%	https://open.umn.edu/opentextbooks/textbooks/771
Unit V	Security Essentials	Basic security threats, Password management, WiFi security	Weblink	Cyber Security Essentials	70%	https://open.umn.edu/opentextbooks/textbooks/771
Unit VI	Version Control	Overview of Git and GitHub, creating repository, commits, branches	PDF	Getting Started with GitHub	90%	https://education.github.com/git-cheat-sheet-education.pdf
Unit VI	Profile Creation	Figma, GitHub, Stack Overflow, HackerRank, GeeksforGeeks	PDF	Guide to Creating Developer Profiles	90%	https://liveyourmessage.com/social-media-profile/



Any Question/ Query?